Name: Date:

Polynomial Factoring solution (version 624)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 49 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(49)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 196}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-52}}{2}$$

$$x = \frac{12 \pm \sqrt{-4 \cdot 13}}{2}$$

$$x = \frac{12 \pm 2\sqrt{13}\, i}{2}$$

$$x = 6 \pm \sqrt{13}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 + 2i$ and $-9 - 4i$ in standard form $(a + bi)$.**

Solution

$$(6 + 2i) \cdot (-9 - 4i)$$

$$-54 - 24i - 18i - 8i^2$$

$$-54 - 24i - 18i + 8$$

$$-54 + 8 - 24i - 18i$$

$$-46 - 42i$$

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3. **Write function $f(x) = x^3 - 5x^2 - 2x + 24$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

Solution

	1	-5	-2	24
3		3	-6	-24
	1	-2	-8	0

$$f(x) = (x-3)(x^2 - 2x - 8)$$

$$f(x) = (x-3)(x-4)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+8) \cdot (x+4)^2 \cdot (x-1)^2$$

Sketch a graph of polynomial $y = p(x)$.